REMARKS

STATUS OF THE CLAIMS

Claims 1-20 are pending in the application.

Claims 1, 2, 6, 9-12, 16, 19 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Gaston.

Claims 3-5, 7, 8, 13-15, 17 and 18 are rejected under 35 USC 103(a) as being unpatentable over Gaston as applied to Claims 1 and 11 above, in further view of Harel et al. (Harel et al., "STATEMATE: A Working Environment for the Development of Complex Reactive Systems," *Proceedings of the 10th International Conference on Software Engineering*, pages 396-406, 1998).

Claims 1 and 11 are amended, new claim 21 is added, and, thus, claims 1-21 remain pending for reconsideration which is respectfully requested. No new matter is added herein.

IN THE SPECIFICATION

The Office Action objected to the specification page 55, lines 3-10 for not specifying version numbers of software discussed therein. According to the forgoing, the specification is amended to provide software version numbers taking into consideration the Examiner's comments. Withdrawal of the objection to the specification is respectfully requested.

REJECTIONS

The independent claims are 1, 11 and new claim 21.

Independent claims 1 and 11 are amended to clarify the patentably distinguishing features of the claimed present invention by emphasizing that the claimed present invention is directed to a support system that has a mechanism designing section, a three-dimensional-mechanism model simulating section, an embedded software developing section, a first interface section, and a second interface section. The second interface section ***transfers actuator instruction data and sensor data*** between the three-dimensional-mechanism model simulating section and the embedded software developing section while synchronizing the three-dimensional-mechanism model simulating section and the embedded software developing section in operation with each other.

Both of Gaston and Harel are totally silent about and fail to disclose or suggest the claimed present invention:

> 1. (Currently Amended) A support system comprising:
>
> a mechanism designing section for three-dimensionally designing a mechanism composed of a plurality of parts including an actuator and a sensor;
>
> a three-dimensional-mechanism model simulating section, in which the mechanism is structured as a three-dimensional-mechanism model, for simulating an operation of the mechanism;
>
> an embedded software developing section for developing a control program, which is to be embedded in the mechanism to control the operation of the mechanism, as embedded software;
>
> a first interface section for inputting designing data, which is created in said mechanism designing section as the result of the designing by said mechanism designing section, from said mechanism designing section to said three-dimensional-mechanism model simulating section to be reflected on the three-dimensional-mechanism model; and
>
> a second interface section ~~for~~ ***transferring actuator instruction data and sensor data*** between said three-dimensional-mechanism model simulating section and said embedded software developing section ***while synchronizing said three-dimensional-mechanism model simulating section and said embedded software developing section in operation with each other*** ~~other; and~~
>
> ~~said second interface section interfacing between said three-dimensional-mechanism model simulating section and said embedded software developing section, while design data produced by said mechanism designing section is reflected, as required, in the three-dimensional-mechanism model, which is structured by said three-dimensional-mechanism model simulating section, through said first interface unit, so that designing of the mechanism and development of the embedded software is concurrently performed~~ (emphasis added).

In particular, Gaston and Harel fail to disclose or suggest the claimed idea of the second interface section that ***transfers actuator instruction data and sensor data while synchronizing the three-dimensional-mechanism model simulating section and the embedded software developing section in operation with each other***. Each of Gaston and Harel therefore fails to disclose or suggest the subject matter of amended claims 1, 11 and new independent claim 21; and in the absence of a considerable reconstruction to at least one of the cited references, any expert in the art would not reach the subject matter recited in claims of the present Application. Support for the claim amendments can be found, for example, in page 25, line 19 to page 27, line 27; page 31, lines 10-21; and FIG. 1, of the present Application.

The Office Action in Response to Arguments, page 6, item 23, provides that "As to "*while* the simulation of the mechanizing is being performed," the claim language does not imply that the simulation of the mechanism is performed at the same time as (*while*) the designing of the mechanism and the development of the embedded software. The simulation of a mechanism is performed after the design of the mechanism and its embedded software in order to test the design for the proper operation." The Office Action in page 4, item f relies on Gaston, column 2, lines 48-57, column 7, lines 16-22, and lines 45-52. In view of the Examiner comments, the independent claims (as well as new claim 21) are clarified to provide in contrast to Gaston, "***developing a control program*** ...a second interface section ~~for~~ ***transferring actuator instruction data and sensor data*** between said three-dimensional-mechanism model simulating section and said embedded software developing section ***while synchronizing said three-dimensional-mechanism model simulating section and said embedded software developing section in operation with each other*** ~~other; and~~" (e.g., claim 1). In other words, the "***transferring actuator instruction data and sensor data*** between said three-dimensional-mechanism model ***simulating*** section and said ***embedded software developing*** section," clarifies that the simulation of a mechanism and embedded software developing for the mechanism is synchronized (page 27, lines 20-27 of the present Application). Accordingly, contrary to the Office Action suggestion in page 6, item 23, in the claimed present invention the simulation of a mechanism is not performed after the design of the mechanism and its embedded software, but in contrast to Gaston, as clearly evidenced in page 25, lines 22-27 and page 27, lines 20-27 of the present Application, the simulation of a mechanism and the embedded software development for the mechanism are synchronized, providing a benefit that design of the mechanism and the developing of the embedded software for the mechanism are performed concurrently or in parallel.

Gaston, column 5, lines 58-60, which the Office Action in page 3, item 9, newly relies to meet the claimed present invention's "simulating," discusses, "Prior to production, the module 115 may be operated using inputs from a simulated control panel implemented by the tool 105." However, this Gaston description refers to testing the control software after it is designed using the tool 105 (column 5, lines 48-49), which fails to disclose or suggest the claimed present invention's, "***developing a control program***" by "***transferring actuator instruction data and sensor data*** between said three-dimensional-mechanism model ***simulating*** section and said ***embedded software developing*** section ***while synchronizing said three-dimensional-mechanism model simulating section and said embedded software developing section in***

operation with each other ~~other; and~~" (e.g., claim 1) and fail to disclose or suggest the claimed present invention's, "***developing an embedded control program*** ... by ***exchanging mechanism data with the three-dimensional-mechanism model simulating while synchronizing the three-dimensional-mechanism model simulating with the developing of the embedded control program***" (e.g., new independent claim 21).

More particularly, the Office Action description references in page 3, item 9, Gaston column 6, lines 26-29; column 5, lines 4-9 and 48-60 (discussed above regarding "simulating"); column 7, lines 1-39; column 7, lines 45-54; column 2, lines 48-57; column 7, lines 16-22; and column 7, lines 45-52; generally discuss product development using the system 100 according to four phase process 300 via the interface module 165 (Gaston, FIG. 3, column 6, lines 13-37). For example, Gaston, column 2, lines 48-57 and column 7, lines 1-55, discusses a Panel Building Workbench 405 and a Logic Workbench 410, which are a graphical drawing tool to design the control panel via graphical icons and a tool to allow the user to create the desired control logic for the appliance 400, respectively. Gaston in column 9, lines 6-22 also discloses a Test Workbench 450 and a Data Acquisition Workbench 455, and according to Gaston, the Data Acquisition Workbench "uses the virtual panel 480 and the communications package 465 to acquire data from the hardware module" (column 9, lines 20-22). However, as discussed in the previous Amendment, in Gaston, the computer 110 interfaces via the interface module 165 with the active components 130 of the target device 120, so that Gaston does not disclose or suggest the claimed present invention's, "***simulating ... while synchronizing***," and column 11, lines 12-19 of Gaston teaches away from the claimed present invention by discussing, "Using the data acquisition workbench 455, the virtual panel 480, and the test workbench 450, the user then tests the control panel design (step 745) on the actual hardware to be included in the appliance. This offers considerable advantages over merely simulating operation of the control panel. If necessary, refinements may be made to the control panel design (step 705) or the control logic (step 710) in response to the test results." Therefore, the pending claims including new claim 21 are allowable over Gaston and Harel.

Accordingly, Gaston including the Gaston discussions newly relied upon in the Office Action, fail to disclose or suggest the claimed present invention's, "***developing a control program***" by "***transferring actuator instruction data and sensor data*** between said three-dimensional-mechanism model ***simulating*** section and said ***embedded software developing*** section ***while synchronizing said three-dimensional-mechanism model simulating section***

and said embedded software developing section in operation with each other ~~other; and~~" (e.g., claim 1) and fails to disclose or suggest the claimed present invention's, "***developing an embedded control program*** ... by ***exchanging mechanism data with the three-dimensional-mechanism model simulating while synchronizing the three-dimensional-mechanism model simulating with the developing of the embedded control program***" (e.g., new independent claim 21). In other words, Gaston's simulating mentioned in column 5, lines 58-60 differs from the claimed present invention's ***synchronized simulating*** and Gaston fails to disclose or suggest the claimed present invention's "***simulating ... while synchronizing***" based upon "***transferring actuator instruction data and sensor data*** between said three-dimensional-mechanism model ***simulating*** section and said ***embedded software developing*** section ***while synchronizing said three-dimensional-mechanism model simulating section and said embedded software developing section in operation with each other*** ~~other; and~~" (e.g., claim 1) and "***simulating while synchronizing***" based upon "***exchanging mechanism data with the ... simulating while synchronizing ... the three-dimensional mechanism model simulating with the developing of the embedded control program***" (e.g., new independent claim 21).

Claims 2-10 and 12-20 each depend directly or indirectly from amended claim 1 and are at least allowable due to their dependencies from independent claims 1 and 11 and/or recite patentably distinguishing features of their own.

Regarding new claim 21, Gaston and Harel fail to disclose or suggest:

> 21. (NEW) A support computer apparatus comprising:
>
> a programmed computer processor controlling the support computer apparatus according to a process comprising:
>
> three-dimensionally designing a mechanism composed of a plurality of parts including an actuator and a sensor;
>
> simulating operation of the mechanism according to a three-dimensional-mechanism model of the mechanism based upon design data from the three-dimensional designing of the mechanism;
>
> ***developing an embedded control program to be embedded in the mechanism*** to control the operation of the mechanism, by ***exchanging mechanism data with the three-dimensional-mechanism model simulating while synchronizing the three-dimensional-mechanism model simulating with the developing of the embedded control program***.

Gaston, which is also relied upon to anticipatorily reject the independent claims 1 and 11,

fails to disclose or suggest "***developing an embedded control program*** ... by ***exchanging mechanism data with the three-dimensional-mechanism model simulating while synchronizing the three-dimensional-mechanism model simulating with the developing of the embedded control program***" (e.g., new independent claim 21). Support for new claim 21 can be found, for example, in page 21, line 1 to page 25, line 18 and FIGS. 3-4; in page 25, line 19 to page 27, line 27 and FIG. 1; and page 27, lines 20-27, of the present Application.

In view of the claims amendment and remarks entry and consideration of this Amendment, withdrawal of the rejections of pending claims, and allowance of pending claims is respectfully requested.

CONCLUSION

If there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

Respectfully submitted,
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